

CHAPTER 2

RESEARCH FRAMEWORK DESIGN AND STUDY AREAS

2.1 INTRODUCTION

This chapter describes the research framework design, method of analysis and background of the study sites. It also highlights key variables such as the profile of respondents and other background information of interests.

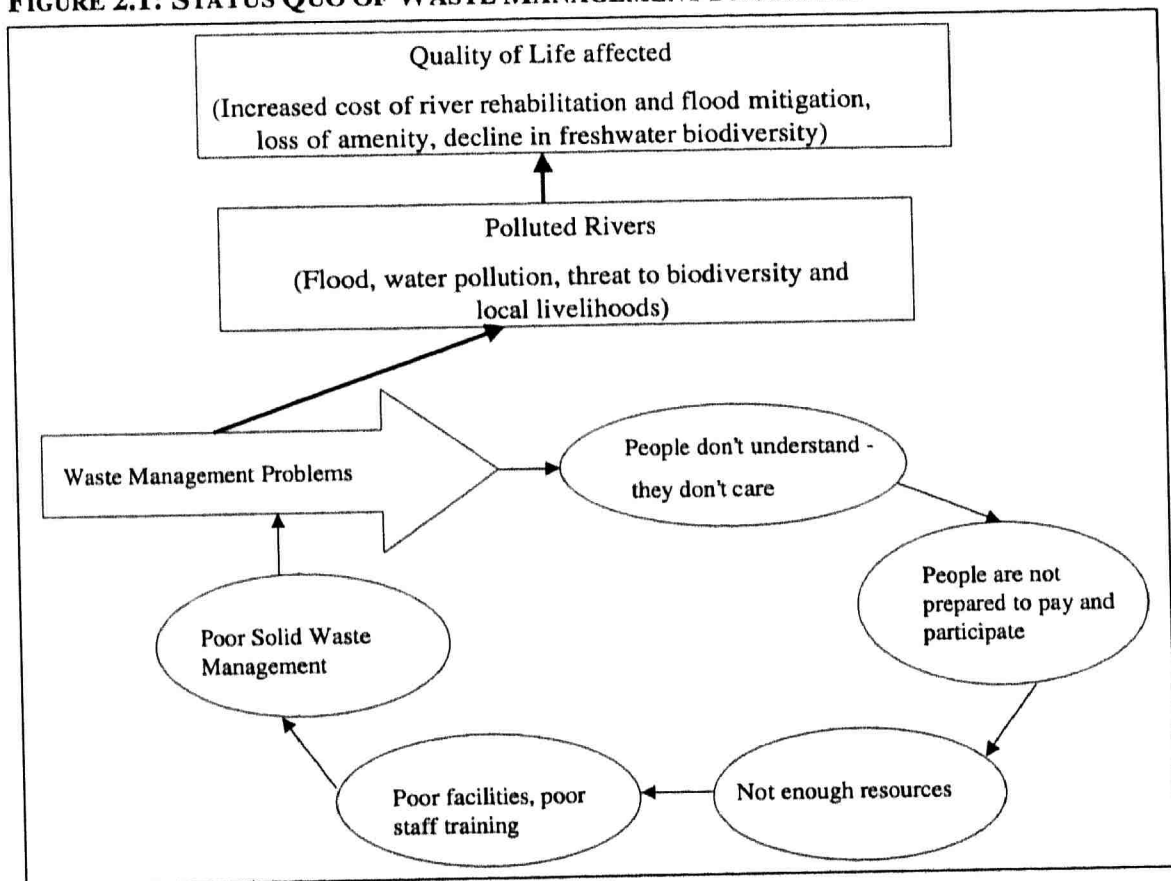
2.2 RESEARCH FRAMEWORK

Research that link environmental dimensions with the roles and impacts of human beings have been undertaken in a significant way only fairly recently. This was after the term sustainable development became popular through the report of the World Commission on Environment and Development (also known as the Brundtland Report) entitled 'Our Common Future' in 1987. It is now increasingly accepted that the environment and human survival are intricately linked. Any element that causes deterioration of the environment would manifest upon the quality of life and health of human beings. According to the United Nations Population Fund's (UNFPA) 1990 annual report, *The State of World Population*, "the quality of human life is inseparable from the quality of the environment". Based on this premise of human-environment inter-relationship, knowledge and awareness of people can therefore contribute to improvements of environmental issues. This includes understanding the behaviour of communities on waste disposal and their perception of how they play a role in environmental conservation. This is important to facilitate policy formulation that tailors the behaviour and needs of communities in order to inculcate a sense of ownership and responsibility towards environmental protection. The interactions and

linkages relevant in this study are illustrated in the research framework provided in Figures 2.1 and 2.2.

The problems with waste management create a downward cycle (Figure 2.1). For example, dumping of household waste causes flood problems, water pollution, threat to biodiversity and declined livelihoods. This in turn reduces quality of life through increased flood problems, flood mitigation, loss of recreational amenity, decline of freshwater biodiversity and loss of livelihoods.

FIGURE 2.1: STATUS QUO OF WASTE MANAGEMENT PROBLEMS



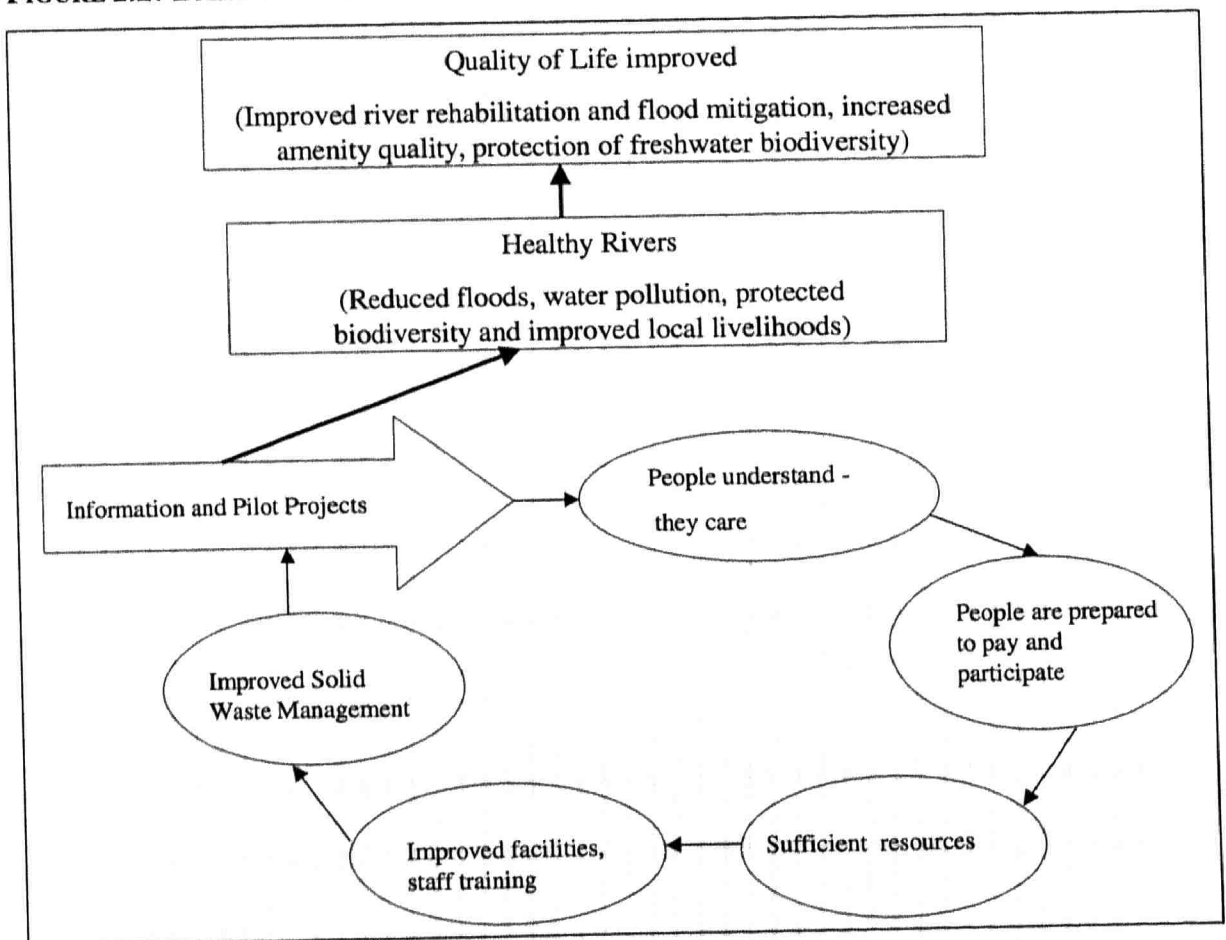
Adapted from: Gray-Donald, 2001 and Skafab, 1998.

In cases where awareness level is low, the community does not care about environmental problems due to difficulty in linking general environmental impacts to the community directly. Hence, they are not prepared to undertake environmental friendly practices and pay for waste management services or facilities. Since few are willing to pay for the services, facilities and management of waste management

remains poor. This in turn leads to a decline in solid waste management and result in the loop to perpetuate into a vicious cycle without any interventions.

Education programmes and waste management community projects may offer an option for breaking the downward spiral (Figure 2.2). Understanding the long term implications of a deteriorating environment on the community, coupled with the belief that the authorities would commit effort to improve waste disposal facilities, communities could be motivated to be involved and comply with waste management practices. This in turn would create greater participation and collection of fees for maintaining proper facilities. Hence, this would promote healthy rivers that in turn support an improved quality of life.

FIGURE 2.2: BREAKING THE DOWNWARD SPIRAL



Adapted from: Gray-Donald, 2001 and Skafab, 1998.

Based on the above research framework, it is therefore necessary to develop appropriate programmes through better understanding and in-depth knowledge of specific communities. Among others, this study would look at various demographic and social characteristics in relation to behaviour and level of environmental awareness and participation of squatter communities. The following are specific hypothesis that would be tested in this study:

- (i) Higher education increases knowledge and interest in environmental participation. Hence, education is an important component in encouraging environmental participation.
- (ii) Younger persons are more likely to be aware of environmental issues due to increasing emphasis on environmental education. Hence, they are more likely to participate in environmental programmes.
- (iii) Respondents of lower income groups are less likely to be aware of environmental issues and hence less likely to participate in environmental programmes. It is assumed that living quarters act as a proxy of income with communities living in squatter type and low cost housing from lower income groups.
- (iv) Females who are more likely to handle household marketing and waste disposal are more likely to be concerned about household wastes and unwanted items.
- (v) Ethnic groups portray varying outlook on environmental issues. Hence, different ethnic groups are likely to respond differently towards environmental programmes.

2.3 RESEARCH DESIGN

Survey questionnaires were used to elicit relevant data required for the cross-sectional study. The survey was conducted in July 2000 by University of Malaya undergraduates. The two areas were identified by the Petaling Jaya Municipal Council (MPPJ) as being areas of interest to better understand practices and behaviour of nearby squatter communities. The students conducted this survey as part of their coursework to learn sampling design and data collection. The variables collected in the survey include practices and behaviour of squatter communities in solid waste disposal, general environmental behaviour and awareness. Background information such as education level, age, occupation, household characteristics were also obtained.

2.3.1 Sample and Questionnaire Design

A total of 380 households were selected using a simple random sampling method. A total of 1620 living quarters were listed in Kg. Sg. Kayu Ara (1570 living quarters) and Kg. Pelumut (50 living quarters), therefore reflecting a 24 per cent sampling intensity.

The questionnaire obtained relevant information on the respondent's background including gender, age, ethnic group, marital status and education level. Apart from that, information on the type of living quarters, ownership and number of persons living in the house was obtained.

Questions on environmental issues can be categorised into four distinct areas. The first solicits answers on the behaviour of the community in terms of present waste disposal such as persons in charge of disposing unwanted items, the volume of disposal in a week, items thrown away and whether wastes are separated.

The second includes questions on general environmental behaviour, opinion and awareness. These questions include who should take care of public areas, whether to car pool to reduce air pollution, opinions on the effects of environmental pollution and interest to know more about environmental issues.

The last area focuses on suggestions and recommendations to improve present environmental conditions in waste management and issues on general environmental protection.

2.3.2 Formatting Data Set and Cleaning

Data were originally keyed using Microsoft Excel programme. For the purpose of this study, the data was imported into the SPSS statistical package. Coding for the SPSS package followed the original coding of the Excel programme. Multiple answers were summarised and recategorised. Consistency and cross checks were also carried out.

2.4 Methods of Analysis

A frequency distribution (Table 2.1) of ethnicity among respondents of Kg. Sg. Kayu Ara and Kg. Pelumut shows that the majority of Kg. Sg. Kayu Ara respondents are Malays while Kg. Pelumut respondents are mainly Indians.

TABLE 2.1: PERCENTAGE DISTRIBUTION OF RESPONDENTS BY ETHNIC GROUPS

<i>Characteristics</i>	<i>Kg. Sg. Kayu Ara</i>		<i>Kg. Pelumut</i>	
	<i>Per cent</i>	<i>n</i>	<i>Per cent</i>	<i>n</i>
<i>Malays</i>	59.4	192	6.4	3
<i>Chinese</i>	12.1	39	4.3	2
<i>Indians</i>	13.6	44	89.4	42
<i>Others</i>	14.9	48	0	0
<i>Total</i>	<i>100.0</i>	<i>324</i>	<i>100.0</i>	<i>47</i>

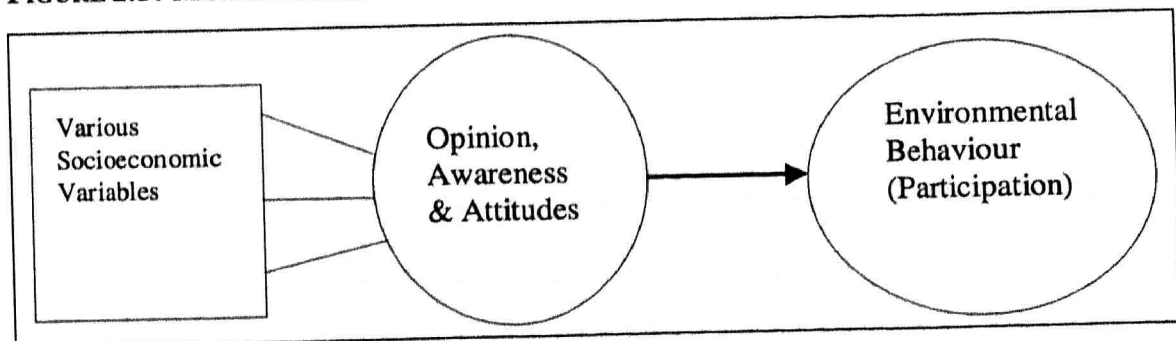
As the two squatter communities are located in the vicinity of each other, it is assumed that the environmental conditions are similar. Hence, both areas are covered and analysed as one to provide ethnic diversity. In addition, there was only a total of 50 living quarters in Kg. Pelumut.

Bivariate analysis is first used to assess the importance of certain independent variables in relation to various dependent measures of environmental practice and knowledge such as household waste behaviour and environmental practices and awareness. The independent variables cover various socioeconomic variables such as age, education, type of living quarters, ethnic group and ownership status.

To measure household waste behaviour, the amount of disposal each week, methods of disposing unwanted items and separation of household wastes are considered. Measurements of environmental awareness and practice consider respondents' responses of the effects of pollution and outcome of household wastes. Environmental behaviour and participation are also measured by willingness to participate in environmentally friendly practices such as car pooling, tree planting and ensuring vehicles do not emit black smoke. Chi-square tests are applied to test for differences where appropriate.

In addition, a multivariate model is attempted. The multivariate analysis assesses the effects of various independent variables simultaneously on the behaviour of respondents in environmental participation (Figure 2.3).

FIGURE 2.3: MULTIVARIATE ANALYSIS FRAMEWORK



In the multivariate model, the dependent variable is PARTICIPATE. PARTICIPATE is coded '1' if respondent recycles, has volunteered at recycling centres or is willing to buy environmental friendly products, and '0' otherwise. The multivariate analysis explains the probability of participating in environmental activities, taking into account explanatory variables that are found to be significant from the Chi-square tests earlier. Logistic regression is used as the dependent variable is a dummy variable. The background and socio-economic independent variables include gender, age group, educational level, ethnic group, type of living quarters and ownership status.

They are:

GDR representing gender of respondents;

MLY representing respondents ethnic descent, Malay or non- Malay;

AGE representing age of respondents

EDU representing educational level of respondents;

OWNSHP representing ownership status of respondents' residence.

LQ representing type of living quarters;

RCTR representing respondents' knowledge of recycling centers ;

AWRE representing respondents' knowledge of various environmental issues (including knowledge of pollution effects and waste outcome);

ATDE representing respondents' action in environmental activities (include buying used items, car-pooling, ensuring vehicles do not emit excessive smoke and reporting open burning to the authorities.

Further details of actual coding are provided in Chapter 5. The overall model may be represented according to the following general equation:

$$\text{PARTICIPATE} = a + b\text{GDR} + c\text{MLY} + d\text{AGE} + e\text{EDU} + f\text{OWNSHP} + g\text{LQ} + h\text{RCTR} + i\text{AWRE} + j\text{ATDE}$$

Where a is a constant

$b, c, d, e, f, g, h, i, j$ are coefficient of X .

The fitted logistic regression model may be specified as follows:

$$P(Y_t = 1) = 1 / (1 + e^{-z})$$

$$\text{where } z = B + B_0X_0 + B_1X_1 + B_2X_2 + B_3X_3 + \dots + B_kX_k$$

The model is estimated using the maximum-likelihood method based on the SPSS Logistic Regression procedure. The Model Chi-square value indicates if the estimated coefficients are significantly different from zero whilst the probability values of the parameter indicate if the parameters are significantly different from zero.

Before presenting the results of the data analysis, it is relevant to briefly describe the survey sites to provide a better understanding of the areas concerned. A profile of the respondents is also presented that includes main explanatory variables.

2.5 Brief Description of Survey Area

Kg. Sg. Kayu Ara and Kg. Pelumut are located within the jurisdiction of the Petaling Jaya Municipal Council (Figures 2.4 and 2.5). These areas are located approximately within 2km from each other. At the time of the survey, there were 1570 recorded living quarters in Kg. Sg. Kayu Ara whilst Kg. Pelumut had 50 recorded family units. Kg. Sg. Kayu Ara is a river reserve area whilst Kampung Pelumut is a Tenaga National Berhad (TNB) or electricity reserve area. Kg. Sg. Kayu Ara has been in existence for more than 25 years and makes up about 23 per cent of the total squatter community in Petaling Jaya (MPPJ, 2000).

Students of University of Malaya first did a listing of households in the location sites and maps were drawn to highlight the facilities available, such as schools, kindergarten and *Suraus*. Kg. Sg. Kayu Ara is located next to Kg. Sg. Kayu Ara River. The area used to be covered by rubber trees. However, the landscape has been significantly altered. The Lebuhraya Damansara Puchong (LDP) now runs across Kg. Sg. Kayu Ara. The village is self-contained and has a few small sundry shops, eateries and also well known for the many car workshops along the highway.

Kg. Pelumut is located within the Tropicana area. The income distribution of residents of Kg. Pelumut and surrounding housing estates that have bloomed in the past ten years are vastly different. However, the new housing areas provide a source of income, especially the women in the area, for example in the form of house cleaning jobs.

FIGURE 2.4: MAP OF KG. SG. KAYU ARA

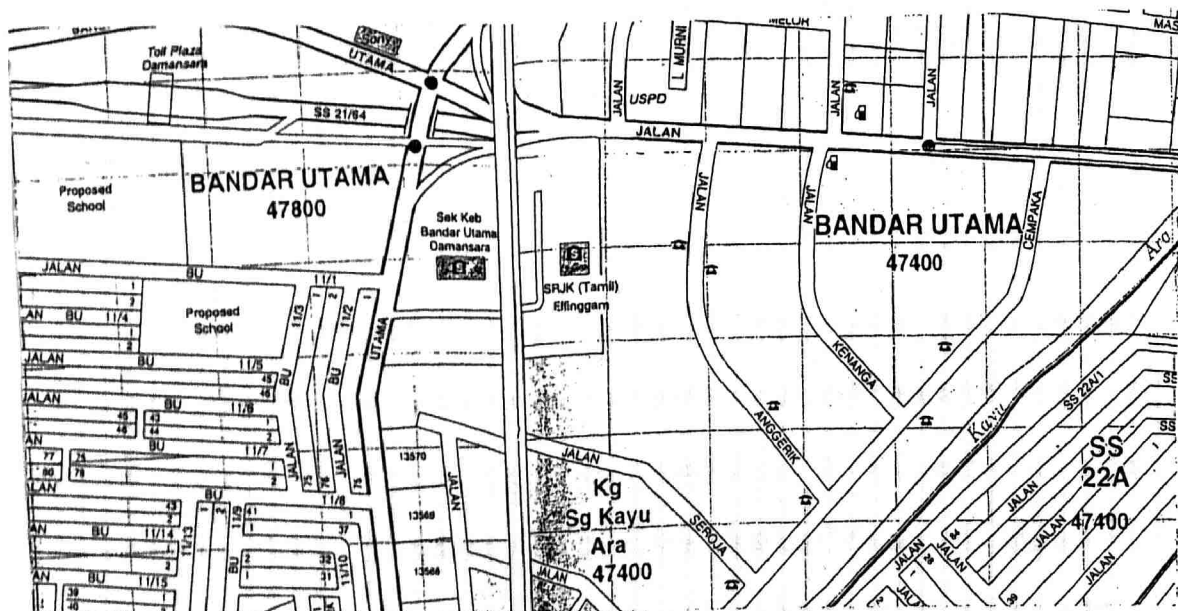
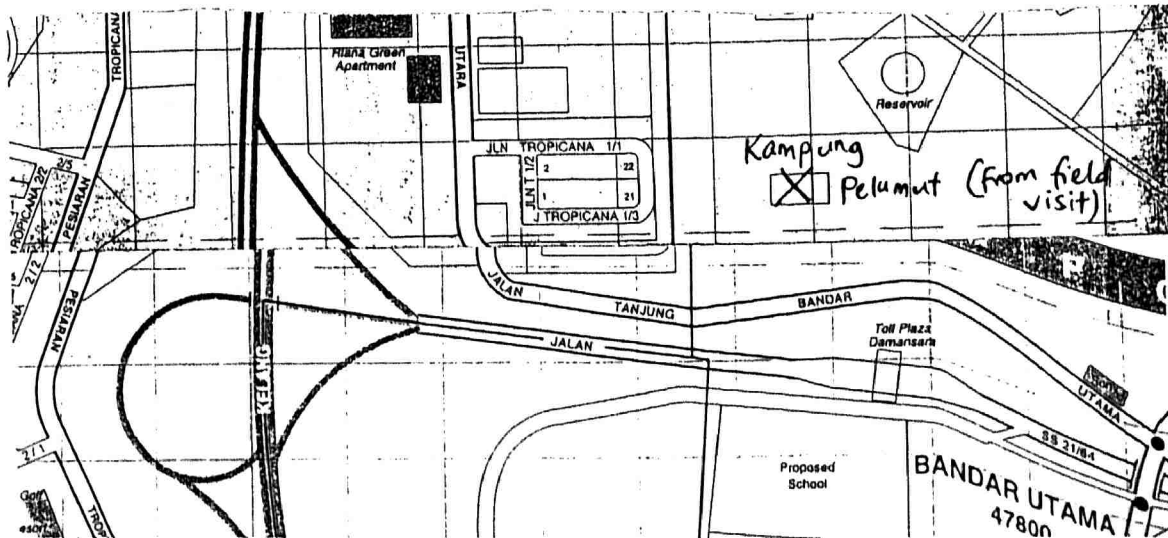


FIGURE 2.5: MAP OF KG. PELUMUT



2.6 PROFILE OF RESPONDENTS

Approximately 37 per cent are spouses of respondents followed by 31 per cent who are head of households, 19 per cent are close family members including parents and children and relatives. The remaining 13 per cent are non-family members such as fellow tenants or employees (Table 2.2).

TABLE 2.2: RELATIONSHIP OF RESPONDENT WITH HEAD OF HOUSEHOLD

<i>Relationship</i>	<i>Per Cent</i>	<i>n</i>
Head of household	30.5	113
Spouse	37.0	137
Close family members and relatives	18.9	70
Non-family member	13.5	50
Total	100	370

The majority of respondents are females (57 per cent) and from the younger age groups - 45 per cent of the respondents are between 21 to 30 years followed by 32 per cent within 31 to 40 years age group (Table 2.3). A high percentage of the respondents are Malays (53 per cent), followed by Indians (23 per cent), Chinese (11 per cent) and others being mainly Indonesians (14 per cent). In fact, the majority of the residents in Kg. Sg. Kayu Ara are Malays whilst the majority of residents in Kg. Pelumut are Indians.

The finding also shows that only 12 per cent of the respondents have attained tertiary education level while most of the rest have secondary education (Table 2.3). Only 10 per cent had no formal education indicating that a high percentage had some basic education and substantial number had fairly high education.

TABLE 2.3: DEMOGRAPHIC PROFILE OF RESPONDENTS

Characteristics	Per Cent	n
Gender	100.0	370
<i>Male</i>	42.7	158
<i>Female</i>	57.3	212
Ethnic Group	100.0	370
<i>Malays</i>	52.7	195
<i>Chinese</i>	11.1	41
<i>Indians</i>	23.2	86
<i>Others</i>	13.0	48
Age Group	100.0	370
21 – 30	45.1	167
31 – 40	31.6	117
41 – 50	14.1	52
>50	9.2	34
Educational Level	100.0	370
<i>No Schooling</i>	10.0	37
<i>Primary</i>	27.0	100
<i>Secondary</i>	50.8	188
<i>Tertiary</i>	12.2	45

2.6.1 Characteristics of Living Quarters

As the two villages are largely squatter communities, the bulk of living quarters are low cost housing and squatter houses (87 per cent) (Table 2.4). The living condition is therefore generally poor quality.

TABLE 2.4: TYPES OF LIVING QUARTERS

Type of Living Quarters	Per Cent	N
High and Medium cost@	12.4	46
Low cost and squatter houses	87.6	324
Total	100	370

@ Medium and high cost living quarters grouped as a category as there are only 2 respondents from high cost living quarters.

The mean household size of squatter houses is smaller at 5.4 compared to 6.3 amongst those living in medium cost living quarters (Table 2.5).

TABLE 2.5: MEAN NUMBER OF MEMBERS BY TYPE OF LIVING QUARTERS

<i>Type of Living Quarters</i>	<i>Mean Household Size</i>
Medium and High cost	6.3
Low cost and squatter houses	5.4
Mean	5.5

Note: Only two respondents living in high cost living quarters. Hence, respondents of medium and high cost living quarters are combined.

The majority of households contain fairly big family units. The majority of the living quarters mainly contain 5 – 6 people (37 per cent) followed by 3 – 4 people (30 per cent) (Table 2.6).

TABLE 2.6: PERCENTAGE OF RESPONDENTS BY HOUSEHOLD SIZE

<i>Household Size</i>	<i>Per Cent</i>	<i>n</i>
2 and below	6.9	25
3 – 4	30.4	109
5 – 6	36.7	134
> 6	26.0	95
Total	100	365

Note: 5 respondents did not provide an answer.

The majority of the respondents are tenants (Table 2.7). This include rented accommodation and to a smaller extent housing owned by employers. Only 35 per cent of the respondents are owners. This is interesting as tenants may feel less attached to their surroundings and hence care less for environmental improvements than owners.

TABLE 2.7: PERCENTAGE DISTRIBUTION OF RESPONDENTS BY OWNERSHIP STATUS

<i>Ownership Status</i>	<i>Per Cent</i>	<i>n</i>
Owner	34.6	128
Tenant	65.4	242
Total	100	370